



# Planning and Construction Research project: methodology

## Example: Describing your data collection procedures

An extensive literature review was conducted to gather information on project characteristics and its classification, construction waste management, waste management plan and its benefits. Subsequently, a set of questions was formulated to gain insight and opinion on the selection of project characteristics and particular benefits of construction waste management and was sent to each of the personnel for their views. The objectives of the survey were:

- to identify the key benefits for implementing waste management in construction projects;
- to collect respondents' views on whether project characteristics have effects on the benefits; and
- to gather respondents' views and insights of other project characteristics that will affect the benefits.

Both close-ended and open-ended questions were adopted in the survey that was divided into two sections. Section A consisted of general questions to identify the profile of respondents and Section B aimed to find out the experts' views and opinions, which allowed experts to state their views on whether project characteristics affect the benefits of waste management as well as to suggest any other project characteristics. The survey questionnaire is included in Appendix 1 (see Figure A1).

About 300 questionnaires were sent out and 66 industry experts responded to the survey questions and they were mainly project managers, assistant project managers, contractors, quantity surveyors, clerk-of-work and site supervisors as shown in Table I. Waste management for construction projects may not be performed without the identified key personnel and their opinions would play a critical role to identify the perception of key players on benefits from waste management. Overall, there is a fairly good mixture of designation of respondents, which would provide a fine

**How data collection instrument was developed**

**Purpose/objectives of the data collection instrument**

**Design of data collection instrument**

**The survey instrument is placed in the Appendix**

**Data collection procedures**  
 - How many surveys were sent & to whom  
 - how many people responded

basis for analyzing their views on this study. Having different years of experience in the construction industry will have a relationship towards the reliability of the responses and about 67 per cent of the respondents have more than six years of experiences in the construction industry. For the purpose of this study, it was important to identify respondents' level of familiarity with waste management as the respondents are supposed to provide their views on whether project characteristics will affect the benefit of waste management. Almost 91 per cent of the respondents were familiar and more familiar with waste management. This may indicate that opinions and suggestions from the respondents are of value and appropriate to be analyzed in context of waste management. The results from the survey were then collated to examine the validity of a hypothesis that characteristics of construction projects have impact on perception on benefits from waste management. The results will be provided and discussed in the following sections.

**How survey data  
was analysed**

(Adapted from Hwang & Yeo 2011, pp. 398-399)

### **Example: Justifying your choices**

According to Noam (2008), a questionnaire survey is suitable when a large amount of data needs to be collected to investigate respondents' view and experiences on a particular phenomenon. Moreover, the time available for data collection was limited. Considering the time allocated for this research, this method was adopted for this research.

(Adapted from Yunus 2012, p. 73)

### **Example: Describing the instrument design and development**

This study involved the analysis of data received from the 43-item MCAS, taken by maintenance personnel from 27 Navy and Marine Corps aviation units. The MCAS is a self-administered survey consisting of nine demographic and 43 maintenance-related items (see Appendix A). The demographic items are: 1) rank; 2) total years aviation maintenance experience; 3) work center; 4) primary shift; 5) current model aircraft; 6) status (active duty, drilling reservist or active reservist); 7) parent command; and 8) unit's location. The maintenance items are grouped into the six HRO components: process auditing, reward system, quality, risk management, command and control, and communication/functional relationships. The MCAS utilizes a five-point Likert scale to capture participant responses: Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree (note: options of Not Applicable and Don't Know are also available).

(Adapted from Hernandez 2001, p. 20)

### **Example: Acknowledge other possibilities**

The primary focus of this project is to ... While alternative methodologies have been used in the past to ... these are not considered appropriate for this study. These alternatives will be discussed in a later section, specifically in relation to why they are not considered feasible.

### **Example: describing the research site**

A watershed on the Texas A&M University campus in College Station, Texas, is used to demonstrate HFR calculations for a realistic watershed and its use for storm-water management. Watershed D on the West Campus contributes to tributaries of White Creek, which is in the headwaters of the Brazos River (Figure 4). Tributary D cuts through the West Campus area, draining 3.2 square kilometers through a natural open channel of 2.0 km in length (Figure 5). Soils in this area are clays and sandy clays with sand lens and are classified as Group D hydric soils, and the CN is 77 (City of Bryan/College Station 2008; Thompson 2005). The upper subwatershed of the watershed is densely occupied by commercial and university facilities, and the lower subwatershed is covered sparsely by urban land use. Because of increased development, erosion and stream bed degradation occurred in Tributary D (Figure 5). Gabions have been placed to alleviate increased velocities, and a detention pond has been recommended for further mitigation of increased storm-water runoff volumes (Thompson 2005).

(Giacomoni et al. 2012, p. 102)

### **Example: describing tests/experiments**

#### ***3.2 Experimental Methodology***

##### ***3.2.1 Small-scale Tests***

Small-scale tests were performed at the University of Maryland College Park. Both horizontal and vertical tests were performed. The horizontal tests were similar to FMVSS 302 as stipulated in the NHTSA Laboratory Test Procedure for FMVSS 302 (FMVSS 2013). Both insulation types, FR Material and Current Material, were cut into 102 mm by 356 mm strips and laid on two thin rods, to support the fabric, in a burn test cabinet. Ignition was caused by a methane Bunsen burner with a flame height of approximately 38 mm placed under the sample (edge of the burner top was 19 mm from the sample). The FMVSS-302 standard requires that the material burn at a rate of no more than 102 mm per minute or stop burning before 60 second, so the results of this study were gauged on these requirements.

The vertical test was performed with samples cut from each insulation of the same size as the horizontal test. The burn test cabinet was placed in the vertical position and the samples secured one at a time in the cabinet. Once again, the methane burner with a flame of 38 mm

was placed under the sample with the burner top 19 mm from the sample for ignition. The same requirements to be met during the horizontal FMVSS 302 test could not be used in the vertical test because of the rapid nature of vertical flame spread; a subjective approach was used to compare horizontal flame spread to vertical flame spread and illustrate why FMVSS 302 does not correlate to vertical orientations.

(Patronik 2008, p. 30)

## **Describing data analysis procedures**

### **Example 1**

The data from the semi-structured interview was organised and transcribed before the data was keyed into analysis software for qualitative data. The software used for this research is QSR NVivo version 9. Bazeley and Richards (2000) highlighted that NVivo is able to categorise data from interview session into nodes that can be explored, organised or changed to answer the research questions. This software allowed the researcher to browse all the data coded at a node, to review the data, to return to the context, or to rethink the idea in interpreting the results. In this way the coding was more systematic and easy to access.

(Adapted from Yunus 2012)

### **Example 2**

The data for the quantitative approach was analysed using statistical tools. Descriptive and inferential statistics were used to analyse the data collected from the questionnaires. As mentioned in Section 3.1, PASW Statistics 18 were used to analyse the quantitative data. This software is a comprehensive system for analysing data and it is able to assist data interpretation more easily (Allen & Bennett, 2010). Tabulated reports, charts, and plots of distributions and trends were generated to show the significance and similarity among the data evaluated.

(Adapted from Yunus 2012)

## References

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